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ABSTRACT

By observing the attentiveness of children watching six pilot programs of "The Electric Company," the staff of the Children's Television Workshop (CTW) gathered detailed data on the visual appeal of the show. Six high appeal attributes were isolated: (1) functionally relevant action; (2) strong rhythm and rhyme; (3) electronic bridges; (4) involving children; (5) on-stage correcting of verbal performance; and (6) "do it one better" theme. Three other studies were also completed: one which demonstrated that the level of attention given to one bit is dependent on the attention given to the preceding bit; one which developed a model to predict the appeal of new material; and one which attempted to refine the definitions of program attributes. (EMH)

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VISUAL ATTENTION TO MATERIAL IN "THE ELECTRIC COMPANY" SUMMARY OF ATTRIBUTE RESEARCH

by

Langbourne W. Rust, Ed.D.

A series of studies were done for the Children's Television Workshop to discover the attributes of program material that most effect target audience attention levels and to develop guidelines for predicting the appeal of new material.

The CTW research staff had gathered detailed data on the visual appeal of the five pilot shows for "The Electric Company." The sample consisted of thirteen second- and third-graders in a day care center at a low-income housing development in New York. Children were observed individually as they watched the shows on a television monitor, and record was taken of whether or not they had looked at the screen every 7½ seconds. Competing with the program material for the child's attention, a back-screen slide projector presented new pictures, one after the other, every 7½ seconds. This "distractor technique" is the standard procedure used by CTW to measure visual appeal.

Before the attribute analysis was begun, the raw data collected by CTW had to be transformed. Overall percentage attention figures for each episode ("bit") were calculated, and these were converted to standard (Z) scores that reflected how far above or below average was the attention to that bit, relative to the overall attention level for the show in which it occurred.

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Study 1: Intrinsic Attributes

Following the research procedure first presented in the dissertation, "Attributes that differentiate boys' from girls' preferences for materials in the preschool classroom: a systems design approach," by Langbourne W. Rust, Ed.D., Teachers College, Columbia University, 1971, the attention scores on each bit were used to discover the attributes that were most strongly associated with high and low appeal.

Nine attributes, intrinsic to the bits in which they were found, were discovered. Of the 149 bits in the five pilot shows, 133 of them (89%) were denoted by at least one attribute definition. 119 bits (80% of the total) had high-appeal or low-appeal attributes exclusively, and to these bits, children's scores were accounted for successfully at a rate of 4.0 to 1.

The six high-appeal attributes were named: functionally relevant action, strong rhythm and rhyme, electronic bridges, involving children, on-stage correcting of verbal performance, and a "do it one better" theme. The full operational specifications of these attributes, of course, were more elaborate and precise. The three low-appeal attributes were: comprehensible spoken script, message monologues, and starting/ending bits.

The findings were instituted as guidelines for all future production at CTW.

In addition to the positive discoveries, a number of attribute definitions that did not work out are of some interest. The duration of bits was not found to bear any systematic relation to attention levels: very long bits were not necessarily unappealing. The presence of a musical score was unrelated to attention, as was the presence of lively

music. Animation per se was neither attractive nor unattractive. Most animated bits had the attribute of functional action, and these were appealing; but the animated bits that did not have this quality were not attended to, and bits that were not animated yet had this attribute had consistently high scores. The identity of the particular characters in a bit did not affect children's responses either; it was what they did and how they did it that was important.

Study 2: Contextual Attributes and an Integrated Predictive Model

The data on which the original analysis was based were more fully explored in this phase, in an attempt to improve predictive accuracy still further. The effect of a bit's context was investigated and a comprehensive system was developed to integrate both intrinsic and contextual factors to predict appeal.

It was demonstrated that the level of attention given to one bit is related to the level of attention that had been given to the bit that preceded it. Bits with similar scores, both higher- or lower-than-average, followed each other 2.6 times as often as did bits with dissimilar scores. The scores of bits following those with exclusively high- or low-appeal attributes were consistent with their estimated context 2.1 times as often as they were inconsistent. There was no evidence that the influence of visual attention to one bit extends beyond the bit immediately following it. It was also demonstrated that context effects only influenced the overall scores of bits that lasted less than one minute; beyond that length, the intrinsic attributes alone accounted best for the scores.

A general model for predicting the appeal of untested material was developed. One begins by determining the intrinsic attributes possessed by each bit in a show; then context effects are estimated; and finally, the two are integrated to yield a prediction for each bit.

Following the model that was developed, children's responses to 94 bits were accounted for successfully, and to 18, unsuccessfully; a ratio of 5.2 to 1.

Study 3: Validation of the Original Model, Prediction to New Material

The model developed in Study 2 was used to predict the responses of a new group of children ($N = 6$) to the material in shows 6-10 of "The Electric Company." The data for this validity check were collected under distractor conditions identical to those employed for the first study. Predictions were made for 88 of a total of 122 bits, and the predictions were accurate in 62 cases: a success ratio of 2.4 to 1. Chi-square, with 2 degrees of freedom, is 20.2 and is significant at a level well beyond $p = .001$. Considering the very small size of the sample (six children) and the consequent high error component in the attention scores, the results were very encouraging.

Comparison of Attribute-Based Predictions with Predictions Based on Pre-Testing

Twenty-three bits had occurred in both the pilot shows and in shows 6-10. It was thus possible to predict the response of the new sample on the basis of the scores obtained previously to the same bits. Predicting higher-than-average and lower-than-average on this basis, a success ratio of 1.9 to 1 was achieved. This compares with the ratio of 2.4 to 1 attained by the attribute-based model. In addition to its advantages in being able to predict responses to untested material, the attribute model seems to predict as well or better than pretesting does.

Modification of the Original Model

The data on children's responses to the new material in shows 6-10

offered some clues for refining the original attribute definitions and the predictive model.

It was found that one attribute, Electronic Bridges, could be eliminated with no net loss in predictive power, and that the attribute, Starting/Ending Bits, was best redefined to denote only show identification material. It was also found advantageous to treat the first bit in each show as having a low-attention context, rather than treating it as if it had no context at all.

These three refinements resulted in a substantial net improvement in accounting for both sets of data. The original model had accounted for 73% of the pooled data with an accuracy of 3.55 to 1 ($x^2 = 60.1$). The refined model accounted for 65% of the same data at 4.50 to 1 ($x^2 = 71.4$). It accounted even better than the original model for the pilot data: 5.6 to 1 versus 5.2 to 1. Considering that the gain in accuracy was achieved through a simplification of the original model, with eight instead of nine attributes, the improvement was a major one.

Study 4: Use by Other Raters

Raters were shown videotapes of the shows being investigated and were asked to classify the bits in them with respect to each of the defined attributes. They had been familiarized with the attributes only through reading their operational definitions. Each definition was evaluated with respect to the consensus between raters as to which bits possessed the attribute in question and which bits did not.

The definitions were evaluated and modified twice to improve their reliability. In the final evaluation three groups of four raters viewed and rated the material of three shows (each rater viewed one show). Average percent agreement between pairs of raters ranged from 76% to 99%

and averaged 87%.

The discriminative power of the modified attribute definitions when used by other raters was also checked. One of the attributes was found to contribute nothing to others' ability to differentiate bits with high appeal from those with low appeal, so it was eliminated. With the remaining seven attributes, the classifications by nine raters of three shows (three raters per show) resulted in 117 accurate predictions, 39 inaccurate ones, and 116 indeterminate. Chi-square indicated a level of discrimination significantly better than chance. With 2 d.f. $x^2 = 31.5$, to which the indeterminate prediction bits contributed only 0.5. $p < .001$.

A comparable sample of nine raters viewed the same three shows and made high, low, and intermediate/unsure predictions about children's responses without reference to any of the defined attributes. These raters were familiar with the distractor condition and with the response that was being measured. While they succeeded in differentiating the bits at better than chance levels ($x^2 = 8.8$ with 2 d.f.), they differentiated the high from the low bits significantly less accurately than had those raters who had used the attribute model. $x^2 = 8.1$ with 1 d.f., $p < .01$.